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ORIGINAL ARTICLE

# Acute sigmoid volvulus: Results of surgical treatment in the teaching hospitals of Bamako

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**KEYWORDS**
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**Summary**
*Objective:* The aim was to evaluate the results of surgical treatment of occlusion of the sigmoid colon due to volvulus.
*Patients and Methods:* This was a retrospective study from 1996 to 2010 of all patients undergoing surgery for sigmoid volvulus in surgical wards of the University Hospital of Bamako.
*Results:* A total of 417 patients were identified including 379 men and 38 women. The mean patient age was 45.7 ± 18.3 years. The general condition of the patients was good in 70.5% and altered in 29.5% of cases. Colonic necrosis was present in 80 patients (19.2%). Single-stage resection with immediate anastomosis was performed in 149 patients (35.73%). Two-stage surgery was performed in 268 cases (64.27%). The initial stage of the two-stage procedure was colostomy in 167 cases and simple detorsion in 101 cases. The surgical approach had an impact on mortality in patients who were in poor general condition. Single-stage surgery resulted in higher mortality (12/149; 8.05%) than two-stage surgery (5/268; 1.87%), and the difference was statistically significant ($P = 0.0005$).
*Conclusion:* Single-stage surgery for sigmoid volvulus carries a high risk of death when it is performed in patients with poor general condition. Indications for surgery must take into account the patient's general condition and the viability of the torsed sigmoid colon.


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## Introduction

Sigmoid volvulus is the torsion of the sigmoid colon loop on its mesenteric axis, producing a distal colonic obstruction, with intestinal ischemia [1]. It is the leading cause of intestinal obstruction in developing countries accounting for up to 50% of obstructions compared with 5% in developed countries [2]. In the USA, it is the third leading cause of colonic obstruction after colon cancer and diverticulosis [3]. The gravity of this condition is due to its progressive evolution. Segmental colectomy or sigmoidectomy followed by a restoration of intestinal continuity is currently accepted as the preferred treatment of volvulus of the sigmoid colon.

The purpose of this study was to evaluate the surgical treatment of colonic obstruction caused by sigmoid volvulus in the hospitals and University Centers of Bamako and to determine the factors affecting operative mortality.

## Patients and methods

This was a retrospective descriptive study of management over a period of 15 years from January 1996 to December 2010 in surgical wards A and B of the CHU Point G and the general surgery department of the CHU Gabriel Touré, Bamako Mali. The study population consisted of patients who underwent surgery for sigmoid volvulus. Patients in whom the diagnosis of sigmoid volvulus was confirmed intraoperatively were included in the study, but patients whose chart could not be evaluated were excluded.

### Principal endpoint

The principal endpoint was mortality defined as the frequency of post-surgical death occurring during the procedure or during postoperative hospitalization.

### Explanatory variables

Explanatory variables, or factors that might explain the patient's death, included the therapeutic approach, the general condition of the patient, the viability of the twisted sigmoid colon, and co-morbidities.

Variables that were extracted for analysis included:

- the general condition of the patient: as determined by age, ASA status, blood pressure, Karnofsky performance status, hemoglobin level, and fever. The appraisal values were «good», and «altered» or «poor». The general condition was considered altered in any patient with a systolic blood pressure $\leq$90 mm Hg, and/or an ASA score >2, and/or a Karnofsky performance status $\leq$70%, and/or a fever $\geq$38 °C, and/or older than 75 years, and/or a hemoglobin level <10 g/dl, and/or having a co-morbidity. Otherwise, general condition was considered good;
- co-morbidities: we considered that there was a co-morbidity when the patient had one or more of the following conditions: hypertension, diabetes, heart disease, pulmonary disease;
- therapeutic approach: two approaches to surgical treatment were considered. The first was a single-stage surgical procedure consisting of sigmoid colon resection followed by immediate colorectal anastomosis without intra-operative colonic lavage. The second approach was two-stage surgical treatment consisting of either simple detorsion followed by second-stage resection with anastomosis, or of resection with colostomy followed by second-stage colorectal anastomosis;
- The state of the torsed sigmoid loop: viable or non-viable.

An individual questionnaire was used to collect information from the medical record including operative report, anesthesia sheets, records of observation and progress notes. Data were entered using Excel software. They were then transposed to Epi Info, version 3.5.3 to determine the frequencies of different variables. SPSS was used to perform logistic regression in the multivariate analysis.

### Univariable analysis

Univariable analysis was performed by comparing the primary endpoint (mortality) with each of the explanatory variables (therapeutic approach, general condition of the patient, time interval to management, co-morbidities and viability of the torsed intestine).

Pearson's Chi-squared test and the corrected Yates test were used to search for association between explanatory variables and the primary endpoint. The association was considered significant for $P$-value $\leq$0.05.

### Multivariable analysis

We modeled the probability of operative mortality due to sigmoid volvulus with factors assumed to influence outcome: condition, co-morbidity, therapeutic approach. All variables with $P$-value $\leq$0.05 in the univariable analysis were entered into a global logistic regression model. Step-by-step removal allowed us to eliminate by order of magnitude (the variable with the largest $P$-values) those variables that were not significantly associated with the primary endpoint ($P$>0.05), resulting in a final model that contained only variables with a $P$-value that remained $\leq$0.05.

## Results

The clinical records of 417 patients operated for sigmoid colon volvulus were collected; these constituted 2.4% (417/17,375) of all surgical emergencies. The mean age was 45.7 $\pm$ 18.3 years with a range of 16—96 years.

The average interval from onset of symptoms to consultation was 44.3 hours with a range of 22—180 hours. The occurrence of intestinal necrosis was not related to the duration of disease progression. However, the degree of intestinal constriction was directly related to the early onset of necrosis although the difference was not significant ($P$ = 0.25).

### Patient characteristics

Table 1 shows the distribution of patients with regard to general condition, co-morbidity, and the viability of the torsed intestine.

The therapeutic approach was: immediate resection with anastomosis in 35.73% (149/417), resection plus stoma in 40.05% (167/417), simple detorsion in 19.90% (83/417) and detorsion with colopexy in 4.32% (18/417).

One hundred and twenty patients in good general condition underwent immediate resection-anastomosis (40.82%). Sixty-nine patients in poor general condition had a Hartmann-type sigmoid colectomy with colostomy (56.10%). Twenty-nine of the 120 patients (23.6%) who underwent